## AMENDMENTS TO THE CLAIMS

Please amend Claims 10, 22, 77 and 81 as set forth below. Please cancel Claims 25, 28, 42 – 49, 51 – 54 and 78 – 80 without any prejudice or disclaimers.

1. **(Canceled)**

2. **(Previously Presented)** An amplification system for outputting pulses having a duration and corresponding pulse width comprising:

a modelocked fiber oscillator outputting optical pulses;

an amplifier disposed external to the modelocked fiber oscillator and optically connected to said modelocked fiber oscillator to receive said optical pulses, said amplifier comprising a gain medium that imparts gain to said optical pulses;

a variable attenuator disposed between said modelocked fiber oscillator and said amplifier, said variable attenuator configured to receive said optical pulses from said modelocked fiber oscillator prior to reaching said amplifier, said variable attenuator having an adjustable transmission such that the amplitude of said optical pulses that are coupled from said mode-locked fiber oscillator to said amplifier can be reduced; and

a compressor disposed external to said amplifier to compress the pulses to reduce the pulse width of the pulses, said compressor receiving amplified pulses from said amplifier,

wherein said amplifier is configured such that attenuating said amplitude of the optical pulses coupled from said mode-locked fiber oscillator to said amplifier reduces the pulse width at an output of said compressor, and

wherein said variable attenuator comprises a polarization selection optics.

3. **(Previously Presented)** The amplification system of Claim 2, wherein said variable attenuator comprises a polarizer.

4. **(Previously Presented)** The amplification system of Claim 2, wherein said variable attenuator further comprises a polarization rotation element.

5. **(Previously Presented)** The amplification system of Claim 4, wherein said polarization rotation element comprises a waveplate.

6. **(Previously Presented)** The amplification system of Claim 2, wherein said variable attenuator comprises one or more optical elements contained in a housing having input and output fibers extending therefrom for coupling light through said one or more optical elements.

7. **(Cancelled)**

8. **(Cancelled)**

9. **(Canceled)**

10. **(Currently Amended)** A method of producing compressed high power short laser pulses having an optical power of at least about 200 mW and a pulse duration of about 200 femtoseconds or less, said method comprising:

substantially mode-locking longitudinal modes of a laser cavity to repetitively produce a laser pulse;

amplifying said laser pulse using an amplifier downstream from the laser cavity;

chirping said laser pulse thereby changing the optical frequency of said ~~optical~~ pulse over time;

compressing said laser pulse using a compressor downstream from the laser cavity by propagating different optical frequency components of said laser pulse differently to produce a compressed laser pulse having a shortened temporal duration; and

selectively attenuating the amplitude of said laser pulse prior to said amplifying of said laser pulse using an attenuator downstream from the laser cavity to further shorten said duration of said compressed laser pulse,

wherein said laser pulse is attenuated by between about 1 to 20 dB.

11. **(Previously Presented)** The method of Claim 10, further comprising substantially maintaining the polarization of said laser pulse after said amplifying until said compressing of said laser pulse.

12. **(Previously Presented)** A method of manufacturing a high power short pulse fiber laser, said method comprising:

mode-locking a fiber-based oscillator that outputs optical pulses;

optically coupling an amplifier to said fiber-based oscillator through a variable attenuator so as to feed said optical pulses from said fiber-based oscillator through said variable attenuator and to said amplifier; and

adjusting said variable attenuator based on a measurement of said optical pulses to reduce the intensity of the optical pulses delivered to said amplifier and to shorten ~~said~~ pulses at the output of the amplifier;

wherein said amplifier and said variable attenuator are disposed downstream from said fiber-based oscillator, and

wherein said optical pulses are attenuated by between about 1 to 20 dB.

13. **(Original)** The method of Claim 12, further comprising optically coupling a pulse compressor to said amplifier to shorten said optical pulses.

14. **(Original)** The method of Claim 12, further comprising pumping said amplifier to amplify said optical pulses from said fiber-based oscillator and compressing said optical pulses, said optical pulses after said amplifying and compressing having an average power of at least about 200 mW and a pulse duration at least as short as 200 femtoseconds.

15. **(Original)** The method of Claim 12, wherein said variable attenuator is adjusted based on a measurement of the power of said optical pulses.

16. **(Previously Presented)** The method of Claim 12, wherein said variable attenuator is adjusted based on a measurement of the pulse duration of said output pulses.

17. **(Previously Presented)** The method of Claim 12, further comprising packaging said attenuator in a sealed housing.

18. **(Previously Presented)** The method of Claim 12, further comprising packaging at least a portion of said oscillator in a sealed housing.

19. **(Canceled)**

20. **(Previously Presented)** The amplification system of Claim 22, wherein said spectral filter comprises a filter selected from the group consisting of a bandpass filter, a low pass filter, and a high pass filter.

21. **(Previously Presented)** The amplification system of Claim 22, wherein said spectral filter comprises a bandpass filter.

22. **(Currently Amended)** An amplification system for outputting pulses having a pulse width, said amplification system comprising:

a modelocked fiber oscillator producing an optical output comprising a plurality of optical pulses having a pulse width and a spectral power distribution having a bandwidth;

an amplifier disposed external to the modelocked fiber oscillator and optically connected to said modelocked fiber oscillator for amplifying said optical pulses; ~~and~~

a variable attenuator disposed between said modelocked fiber oscillator and said amplifier; and

a spectral filter disposed external to the modelocked fiber oscillator and between said oscillator and said amplifier, said spectral filter configured to receive said optical output of said modelocked fiber oscillator prior to reaching said amplifier, said spectral filter having a spectral transmission with a band edge that overlaps said spectral power distribution of said optical output of said modelocked fiber oscillator to attenuate a portion of said spectral power distribution and thereby reduce the spectral bandwidth, the pulse width of said optical pulses coupled from said modelocked fiber oscillator to said amplifier thereby being reduced,

wherein said spectral filter reduces the spectral bandwidth to less than about 12 nanometers, ~~and~~

wherein said spectral filter has a spectral bandwidth of between about 5 and 12nm; and

wherein said variable attenuator comprises polarization selection optics.

23. **(Previously Presented)** The amplification system of Claim 22, wherein said spectral filter comprises a grating.

24. **(Previously Presented)** The amplification system of Claim 22, wherein said spectral filter comprises a long period fiber Bragg grating.

25. **(Canceled)**

26. **(Previously Presented)** The amplification system of Claim 22, wherein said spectral filter is disposed in a housing having input and output fibers that couple optical output of said modelocked fiber oscillator through said spectral filter.

27. **(Canceled)**

28. **(Cancel)**

29. **(Previously Presented)** A method of producing compressed optical pulses, said method comprising:

substantially mode-locking longitudinal modes of a fiber resonant cavity so as to produce a train of modelocked optical output pulses having a corresponding spectral power distribution with a spectral bandwidth;

amplifying said modelocked optical output pulses using an amplifier external to said fiber resonant cavity;

compressing said modelocked optical output pulses using a compressor external to said fiber resonant cavity to produce compressed optical pulses; and

reducing the spectral bandwidth of said spectral power distribution prior to amplifying using a spectral filter external to said fiber resonant cavity such that said compressed modelocked optical output pulses have a shorter duration,

wherein said spectral bandwidth is reduced to less than about 12 nanometers, and

wherein said spectral bandwidth is reduced by between about 5 to 12 nm.

30. **(Previously Presented)** The pulsed fiber laser of Claim 29, wherein said spectral bandwidth is reduced to less than about 10nm.

31. – 41. **(Canceled)**

42. **(Canceled)**

43. **(Canceled)**

44. **(Canceled)**

45. **(Canceled)**

46. **(Canceled)**

47. **(Canceled)**

48. **(Canceled)**

49. **(Canceled)**

50. **(Canceled)**

51. **(Canceled)**

52. **(Canceled)**

53. **(Canceled)**

54. **(Canceled)**

55. – 74. **(Canceled)**

75. **(Previously Presented)** The amplification system of Claim 2, wherein said compressor comprises one or more dispersive optical elements.

76. **(Previously Presented)** The amplification system of Claim 75, wherein said one or more dispersive optical elements comprises a dispersive optical fiber.

77. **(Currently Amended)** The amplification system of Claim 2, wherein said ~~laser~~ pulses are attenuated by between about 1 to 20 dB.

78. **(Canceled)**

79. **(Canceled)**

80. **(Canceled)**

81. **(Currently Amended)** A system for producing compressed high power short laser pulses having an optical power of at least about 200 mW and a pulse duration of about 200 femtoseconds or less, said system comprising:

a mode locked oscillator to mode-lock longitudinal modes of a laser cavity to repetitively produce a laser pulse;

at least one fiber amplifier amplifying said laser pulse, said at least one amplifier disposed downstream from the laser cavity;

a pulse stretcher comprising a length of optical fiber or a chirped fiber Bragg grating, said stretcher chirping said laser pulse thereby changing the optical frequency of said optical pulse over time;

a pulse compressor to compress said laser pulse by propagating different optical frequency components of said laser pulse differently to produce a compressed laser pulse having a shortened temporal duration, said compressor disposed downstream from the laser cavity; and

an attenuator to selectively attenuate ~~attenuating~~ the amplitude of said laser pulse prior to said amplifying of said laser pulse, said attenuator disposed downstream from the laser cavity to further shorten said duration of said compressed laser pulse, and wherein said laser pulse is attenuated by between about 1 to 20 dB.

82. **(Previously Presented)** The system of Claim 81, wherein said variable attenuator comprises a polarization selection optic.